

[0001] Having thus described the invention, what is claimed is:

1 1. A hydraulic steering device for vehicles with an articulated joint between
2 major ground-engaging components of the vehicles, comprising:
3 a least one hydraulic swivelling motor for producing the steering move-
4 ment;
5 a hydraulic pump with a variable flow rate and reversal of the direction of
6 delivery, the pump in fluid flow communication with the at least one swivelling
7 motor;
8 the at least one swivelling motor further being a swivelling vane motor in-
9 corporated into the articulation joint or arranged on the turning axle of the articu-
10 lation joint.

1 2 The steering device of claim 1, wherein:
2 the variable flow pump with reversal of its delivery direction is also a con-
3 stant displacement pump, driven by a controlled variable speed electric motor.

1 3 The steering device of claim 1, wherein:
2 the variable flow pump with reversal of its delivery direction is a variable
3 displacement axial piston pump with a swashplate.

1 4 The steering device of claim 1, wherein:
2 the at least one swivelling motor is arranged above and/or beneath the ar-
3 ticulation joint.

1 5. The steering device of claim 2, wherein:
2 the at least one swivelling motor is arranged above and/or beneath the ar-
3 ticulation joint.

1 6. The steering device of claim 3, wherein:
2 the at least one swivelling motor is arranged above and/or beneath the ar-
3 tication joint.

1 7. The steering device of claim 1, further including:
2 an electronic controller connected to and controlling the operation of the
3 pump.

1 8. The steering device of claim 7, wherein:
2 the electronic controller is a micro-processor.

1 9. The steering device of claim 2, further including:
2 sensors for recording the steering angle and further system parameters of
3 state are positioned on the at least one motor.

1 10. The steering device of claim 3, further including:
2 sensors for recording the steering angle and further system parameters of
3 state are positioned on the at least one motor.

1 11. The steering device of claim 8, further including:
2 sensors for recording the steering angle and further system parameters of
3 state are positioned on the at least one motor.

1 12. The steering device of claim 7, further including:
2 a joystick connected to said electronic control element for setting the
3 steering angle.

1 13. The steering device of claim 12, wherein the joystick includes a force-
2 feedback function.

1 14. The steering device of claim 11, further including:
2 a joystick connected to said electronic controller for setting the steering
3 angle.

1 15. The steering device of claim 14, wherein the joystick includes a force-
2 feedback function.

1 16. The steering device of claim 11, wherein:
2 the at least one swivelling motor is a swivelling vane motor.

1 17. The steering device of claim 16, further including:
2 a set angle prescribed by the operator is recorded in the micro-processor,
3 and depending upon that the quantity and direction of the volume flow to the at
4 least one hydraulic steering motor is influenced.

1 18. The steering device of claim 17, wherein:
2 the actual angle of the steering device is recorded in the micro-processor
3 and the volume flow to the steering motor is controlled by a control algorithm
4 which is selectively variable depending upon the operating state of the vehicle, in
5 particular a steering angle control and/or a steering angle velocity controller.